

Global Scale Auroral Emissions on Jupiter L. Trafton

Jupiter's aurora are normally confined to limited regions around the magnetic poles. Our collected spectra show that very unusual periods of global scale auroral activity occurred during September and November of 1988. During the global scale events, the H_2 and H_3^+ emissions remained confined to their unusual auroral zones but strong, unidentified emissions appeared in the vicinity of the H_2 quadrupole lines. This would suggest that unusual periods of widespread magnetospheric dumping occur. This activity contrasts with the very weak auroral emission seen only a year later. In addition, long-term time scales have been observed for Jovian auroral activity within the normal auroral zones. For example, the relative strengths of the H_2 and H_3^+ emissions are observed to change. There even have been times, as in 1986, when the H_3^+ was not detectable while the H_2 emission was clearly visible. Jupiter's magnetosphere, which powers the aurorae, is thought to be populated largely by Io's volcanic activity. Further monitoring is continuing to test the validity of this linkage.